Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (CURRENTLY AMENDED) An apparatus, comprising:

a multilayer structure comprising:

a free layer;

an antiferromagnetic layer between a pinned layer and a pinned keeper layer ~~first and second layers~~, the ~~first and second layers~~ pinned layer and a pinned keeper layer neighboring the antiferromagnetic layer, the antiferromagnetic layer having exchange anisotropy that helps pin the magnetization direction of the ~~first~~ pinned layer and helps pin the magnetization direction of the ~~second~~ pinned keeper layer, the magnetization direction of the pinned layer is antiparallel to the magnetization direction of the ~~such that the first layer comprises a pinned layer and the second layer comprises a~~ pinned keeper layer[[,]];

a nonmagnetic spacer layer between the pinned layer and the antiferromagnetic layer, the spacer layer separating the pinned layer and the antiferromagnetic layer so that the pinned layer promotes a GMR effect within the free layer;

wherein the pinned layer ~~producing~~ produces first pole densities and a resulting first magnetic field within the free layer that are approximately canceled by second pole densities and a second magnetic field ~~within the free layer resulting from second pole densities~~ produced by the pinned keeper layer[[,]] to substantially remove any undesired bias on the free layer ~~the~~ resulting in a magnetization direction of the ~~first~~ free layer ~~is antiparallel to the magnetization direction of the second layer~~ that exhibits a balanced swing with respect to flux that emanates from or terminates upon a disk surface.

6. (PREVIOUSLY PRESENTED) The apparatus of claim 1 wherein the resistance associated with each of the layers of said larger multilayer structure is such that most of the current flow through said sensor flows through said antiferromagnetic layer.

7. (ORIGINAL) The apparatus of claim 6 wherein said current flow is centered along the thickness of said antiferromagnetic layer.

8. (PREVIOUSLY PRESENTED) The apparatus of claim 1 wherein the resistance associated with each of the layers of said larger multilayer structure are such that more current flows through said sensor outside said antiferromagnetic layer than inside said antiferromagnetic layer.

9. (ORIGINAL) The apparatus of claim 8 wherein said antiferromagnetic layer material is an oxide.

10. (PREVIOUSLY PRESENTED) The apparatus of claim 1 wherein said pinned layer and/or said pinned keeper layer is a hard magnetic layer.

11. (CURRENTLY AMENDED) An apparatus, comprising:

a) a disk; and

b) a head configured to be disposed over said disk, said head comprising, a multilayer structure, said multilayer structure comprising:

a free layer;

an antiferromagnetic layer between first and second layers, the first and second layers neighboring the antiferromagnetic layer, the antiferromagnetic layer having exchange anisotropy that helps pin the magnetization direction of the first layer and helps pin the magnetization direction of the second layer, such that the first layer comprises a pinned layer and the second layer comprises a pinned keeper layer, <u>the magnetization direction of the pinned layer is antiparallel to the magnetization direction of pinned keeper layer;</u>

wherein the pinned layer ~~producing~~ produces first pole densities and a resulting first magnetic field within the free layer that are approximately canceled by second pole densities and a second magnetic field ~~within the free layer resulting from second pole densities~~ produced by the pinned keeper layer~~, wherein said magnetization direction of said first layer is antiparallel to said magnetization direction of said second layer~~ to substantially remove any undesired bias on the free layer resulting in a magnetization direction of the free layer that exhibits a balanced swing with respect to flux that emanates from or terminates upon a surface of the disk.

16. (PREVIOUSLY PRESENTED) The apparatus of claim 11 wherein the resistance associated with each of the layers of said larger multilayer structure is such that most of the current flow through said sensor flows through said antiferromagnetic layer.

17. (PREVIOUSLY PRESENTED) The apparatus of claim 16 wherein said current flow is centered along the thickness of said antiferromagnetic layer.

18. (PREVIOUSLY PRESENTED) The apparatus of claim 11 wherein the resistance associated with each of the layers of said larger multilayer structure are such that more current flows through said sensor outside said antiferromagnetic layer than inside said antiferromagnetic layer.

19. (PREVIOUSLY PRESENTED) The apparatus of claim 18 wherein said antiferromagnetic layer material is an oxide.

20. (WITHDRAWN) A method comprising:

cooling a multilayer structure having an antiferromagnetic layer from a temperature above an antiferromagnetic blocking temperature to a temperature below said antiferromagnetic blocking temperature while a first magnetic field is established

within a first layer to pin the magnetization direction of said first layer and while a second magnetic field is established within a second layer to pin the magnetization direction of said second layer.

21. (WITHDRAWN) The method of claim 20 wherein said first field is antiparallel to said first field.

22. (WITHDRAWN) The method of claim 21 wherein said first and second fields are formed by directing a current through said multilayer structure, said first and second fields antiparallel to each other.

23. (WITHDRAWN) The method of claim 21 wherein said first and second fields are at least partially formed by directing more current outside said multilayer structure than inside said multilayer structure.

24. (WITHDRAWN) The method of claim 23 further comprising applying an external magnetic field, said external magnetic field fully forming said first and second magnetic fields when combined with fields produced by said current.